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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,538	06/15/2001	Alexander Kalnitsky	60305-307201	8283

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EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/882,538

Applicant(s)

KALNITSKY ET AL.

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 22 recites the limitation "the polysilicon layer thickness" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 4, 6, 8, 10, 11, 13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryum et al., hereinafter Ryum (U.S. 6,337,494) in view of Kubota (U.S. 6,323,530), all previously cited.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Regarding claims 1, 8, 15, and 21, Ryum discloses a method comprising the steps of providing a semiconductor substrate having a buried collector region; providing multiple layers above the collector region (see column 4, lines 1-8); providing three vertical etchings of the multiple layers (see column 4, lines 43-49); providing a window mask above the multiple layers; providing a doping of the collector region (see column 4, lines 62-68); providing a base region above the collector region; and providing an emitter region above the base region (see column 4, lines 10-24). Furthermore, Ryum discloses horizontal etching, wherein the etching determines that the dimensions of the base region are wider than the collector and emitter region (see figures 4I-L, and column 9, lines 1-20).

Ryum does not disclose wet etching is used.

Kubota discloses horizontal and wet etching are used conventionally in the art as etching methods (see column 2, lines 34-41). Therefore, it would have obvious to one of ordinary skill in the art at the time of the invention to use these commonly used etching method in order to etch the layers above the buried collector layer.

Regarding claims 6 and 13, see column 4, lines 9-12 and 43-49; and figure 3, where layers 12 and 12-1 are base layers and 14 and 2 are emitter and collector layers, respectively.

Regarding claim 3, see column 4, lines 29-33.

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Regarding claims 4, 10, 11, and 18, Ryum discloses a first and a second insulating film on the multiple layers, which are oxide and polysilicon (see column 4, lines 6-9). Ryum also discloses the first insulating film is an oxide (see column 4, lines 34-36). Furthermore, Ryum discloses horizontal etching, wherein the etching determines that the dimensions of the base region are wider than the collector and emitter region (see figures 4I-L, and column 9, lines 1-20).

Ryum teaches to use silicon nitride in the multiple layers, as set forth in column 4, line 33. Therefore, it would have obvious to one of ordinary skill in the art at the time of the invention to use nitride as the second layer in order to make an insulating layer.

Regarding claims 16 and 17, see figures 4A-4L.

Regarding claims 19 and 20, Ryum discloses that the invention minimize the parasitic resistance of the base, hence improving power gain. It would have been obvious to one of ordinary skill in the art at the time of the invention to control the etching and the base thickness in order to have the desired power gain.

6. Claims 5, 7, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryum in view of Kubota, as applied to claim 1 above, and further in view of Streetman (Solid State Electronic Devices), previously cited.

Regarding claims 5 and 12, Ryum in view of Kubota dose not discloses phosphorus or arsenic used in doping of the collector, using ion implantation.

It is well known in the art to use these material and ion implantation in order to make n-type material (see Streetman, page 2, table1-1, column 5; and page 149, second paragraph). Therefore, it would have obvious to one of ordinary skill in the art at

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the time of the invention to use phosphorus or Arsenic with ion implantation in order to make n-type material, and perform doping at a relatively low temperature, respectively.

Regarding claims 7 and 14, Streetman discloses isotropic plasma etch is a common etching method (see page 155, the paragraph under the title Etching).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use this etching method to etch as fast horizontally as vertically.

Response to Arguments

7. Applicant's arguments filed on 5/13/02 have been fully considered but they are not persuasive.

The applicant merely argues that independent claims 1, 8, and 18 are patentably distinguishable, and therefore, dependent claims 3-7, 10-17, 19, and 20 are also patentably distinguishable. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9318 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
July 15, 2002


OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800